

Fig. 1.-Map of the new Canadian Provinces. (By permission of Doubleday, Page & Co.)

## NEW CANADIAN PROVINCES.

The Editor has obtained from Doubleday, Page & Co., publishers of The World's Work, permission to reprint the chart that appeared on page 6612 of the September number of that journal showing the recent changes in the boundaries of the Canadian Provinces. The heavy black lines show the boundaries of the two new provinces in western Canada which came into legal existence on the first of September. Alberta as a province comprises the former territorial district of Alberta, a small portion of the districts of Assiniboia and Saskatchewan and the western half of Athabaska. province of Saskatchewan comprises the greater portion of the old territories of Saskatchewan and Assiniboia, and the eastern half of the former territorial district of Athabaska. The boundaries of Manitoba, Ontario, British Columbia, Yukon, Mackenzie, and Keewatin do not appear to have been changed The route of the proposed Canadian Northto any extent. ern Railway is shown on this map, fig. 1.

The new provinces Alberta and Saskatchewan, extending from 49° north latitude on the south to 60° on the north, embrace about 145 square degrees, and are generally now spoken of together as western Canada. During the past ten years they have been settled by over 500,000 immigrants, a large portion of whom come from the United States.

The land is a prairie soil especially adapted to the growth of wheat and to grazing on a large scale.

Regina is at present the capital of the new Saskatchewan, but other towns are competing for that privilege. Edmonton is at present the capital of the new Alberta, having wrested that honor from Calgary.

With regard to the meteorology of this region, Mr. B. C. Webber, Assistant Director of the Meteorological Service of Canada, writes that no new stations will be established in the immediate present, but such may be expected from time to time in the near future.

Of the stations whose data are published regularly in Table 5 of our Monthly Weather Review Battleford, Prince Albert, Qu'Appelle, Swift Current, now belong to Saskatchewan. Banff, Calgary, Edmonton, and Medicine Hat now belong to Alberta.

# THE GREEN RAY AT SUNSET.

The observation of the green ray seen just as the last glimpse of the sun disappears below the sea horizon was originally introduced into meteorology by Tyndall as an evidence of the special absorptive power of the aqueous vapor in the lowest layer of the atmosphere. A short memoir on this subject was lately published by W. H. Julius in the Archives of the Academy of Sciences of the Netherlands, and in reviewing this work in the Physikalische Zeitschrift, 1905, page 24, Dr. H. Schering says:

After a short résumé of the phenomena as described by others, according to whom the so-called green ray appears as a greenish-blue column of light or flame that is seen on very clear days at the moment of the appearance at sunrite or disappearance at sunset of the upper edge of the sun behind the horizon, Julius describes his own observations near Sicily and Suez, in the Red Sea and the Indian Ocean. According to him, at sunset the yellowish orange segment assumes gradually a greenish tint, while the sun's limb is sharply defined and without any other color. The green also extends beyond the neighborhood of the orange segment, especially is it visible at the two ends of the segment at the instant when, by the junction of these ends and the disappearance of the sun, it assumes the form of a small flame. The duration of the phenomenon varies somewhat, but may be estimated at two seconds.

Sohnke, Schülke, Ekama, and others explain the green ray as a consequence of the dispersion due to refraction. But the execution of a short computation gives for the breadth of such a green blue border produced by dispersion at the sun's limb, when it is in the horizon ten seconds of arc, and when it is ten degrees above the horizon, 1.6 seconds. That is to say, the phenomenon should not last more than two-thirds of a second of time at sunset behind the natural horizon in the Tropics, and only one-tenth of a second of time when the sun disappears behind a mountain at ten degrees above the horizon. Since this older explana-

tion does not agree with the author's observations, Julius proposes another, namely, that the phenomenou is produced by anomalous dispersion and that in fact the free ions, which according to Ebert and Lenard are most numerous in the upper strata of air, are in general the cause of the terrestrial absorption. In this way the rarity of the phenomenon, its dependence on meteorological conditions, and its slow diminution of duration with the altitude above the horizon may be accounted for. But H. Schering remarks that independent of the fact that, according to the latest measurements in free balloons made by Luedeling as well as by Gerdien, an increase of ions at the greatest altitudes is not probable, there exists such a great difference in the magnitude of the number of ions and the number of molecules in a cubic centimeter that we ought not to expect such a spectral effect as Julius assumes even if the ionization were many thousand times greater than is ordinarily found. In fact, the average number of ions in a cubic centimeter is only  $1\times 10^{8}$ , whereas the number of molecules is  $2\times 10^{19}$ .

#### BALL LIGHTNING.

A letter from Mrs. A. E. Russell, of Paducah, Ky., reports the following phenomenon which seems to be as genuine a case of ball lightning as any that has hitherto been described:

My niece and I were sitting in my front half on July 16, 1905, when suddenly, without warning, what seemed like a big ball of fire passed between our heads. My niece's head was not distant more than six

inches from our telephone box. She experienced no shock, while I was blinded by it for half a minute.

The front and back hall doors were screened! but they showed no sign of any lightning having touched them. A tree in the back yard about ten yards from the back hall door had a round hole made in the bark with a dent in the wood just as if a cannon ball had been shot against it. The three horses standing near the tree were knocked down; the horse standing in a straight line between the tree and the house seemed dead for a long while.

My niece says that there had been a low rumbling noise of thunder just previous to the lightning, but I did not hear it. A neighbor who had left my house two minutes before and was on the road says she heard no thunder and saw no lightning until suddenly a terrific explosion seemed to occur just over her head; she was blinded and saw nothing more.

I have witnessed the lightning strike trees three times on our front lawn, but I never before saw a ball of fire.

#### CORRIGENDA.

MONTHLY WEATHER REVIEW for 1904, Vol. XXXII, No. 13, Annual Summary, page 605, first column, line 41, for "levelings" read "altitude"; line 42, for "Prof. Joseph N. Le Conte" read "the director of the U. S. Geological Survey." For August, 1905, page 350, column 2, "Rivers and Floods," line 7, for "northern" read "southern."

## THE WEATHER OF THE MONTH.

By Mr. Wm. B. STOCKMAN, Chief, Division of Meteorological Records.

#### PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart VIII and the average values and departures from normal are shown in Tables I and V.

The mean barometric pressure for the month was highest over New England, the Middle Atlantic States, northern portion of the South Atlantic States, Ohio Valley and Tennessee, and lower Lake region, with the crest over northeastern West Virginia carrying a value of 30.11 inches. The mean pressure was lowest over southeastern California and southwestern Arizona, the minimum, 29.76 inches, occurring at Yuma.

The mean pressure for the month was .01 to .03 inch above the normal in Virginia, eastern West Virginia, and northwestern California; elsewhere it was below the normal, but with slight departures, except over northeastern California, west-central Nevada, Washington, northern Idaho, and northwestern Montana, where they ranged from -.05 to -.08 inch.

The mean pressure diminished from that of August, 1905, in southern Florida, western New Mexico, Arizona, Utah, Colorado, Wyoming, western South Dakota, Montana, except the northeastern portion, Washington, except the southeastern portion, western Oregon, and California, except the extreme northeastern portion; elsewhere the mean pressure increased. The decrease was greatest over western Washington, where it ranged from -.05 to -.12 inch; and the increase was most marked over the Atlantic States as far south as central North Carolina, lower Lake region, southern portion of the upper Lake region, central Mississippi and Jower Missouri valleys, and the Ohio Valley and Tennessee, where it ranged from +.05 to +.09 inch.

### TEMPERATURE OF THE AIR.

The mean temperature for the month was below the normal in New England, except southwestern Connecticut, northeastern and east-central New York, northeastern and southwestern Pennsylvania, northwestern West Virginia, western Arizona, California, except the east-central and northwestern portions, northwestern Nevada, extreme northwestern Oregon, and on the immediate coast of Washington; elsewhere it was above the normal. The negative departures were less than 1.0°, except in one instance in central California, while the

positive departures generally were greater than  $2.0^{\circ}$ , and more than  $4.0^{\circ}$  in southwestern Kansas, east-central Nebraska, southeastern Wisconsin, north-central upper Michigan, western Minnesota, and North Dakota, and from  $+5.0^{\circ}$  to  $+5.3^{\circ}$  in eastern Montana.

The average temperatures for the several geographic districts and the departures from the normal values are shown in the following table:

Average temperatures and departures from normal.

Number of stations.	Average tempera- tures for the current month.	Departures for the current mouth,	Accumu- lated departures since January 1.	Average departures since January 1
8 12 10 8 9 7 11 11 8 10 8 11 11 7 6 6 13 8	56. 9 67. 1 75. 6 80. 7 77. 8 69. 6 64. 4 62. 2 59. 8 67. 0 67. 7 61. 4 74. 4 60. 6	0 -0.9 +0.8 +2.4 +1.5 +2.5 +2.6 +1.4 +1.3 +3.0 +2.6 +2.3 +2.7 +0.2 +0.2 +0.2		-1. -0. -0. -0. -0. -0. -1. -0. -0. +0. -0. -1. -0. +0. +1. +1.
	Number o Stations of 11 11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Average temperatures for the current month.  8 56.9 12 67.1 10 75.6 8 80.7 7 78.6 11 69.6 8 64.4 10 62.2 8 11 67.0 11 67.7 7 61.4 6 74.5 13 60.7 8	Average temperatures for the tures for the current month.	Accumulated tures for the current month.   Departures for the current month.     Departures for the current month.

\* Regular Weather Bureau and selected cooperative stations.

Maximum temperatures of 80°, or higher, were reported from all sections, except the coast of Maine, the islands off Massachusetts and Rhode Island, the northern portions of New Hampshire and Vermont, the mountain regions of Colorado, and the northwestern portion of Washington; 90°, or higher, in the South Atlantic and Gulf States, Tennessee, except the mountain districts, lower Ohio Valley, southern portions of the upper Mississippi and Missouri valleys, and generally over the slope and Pacific regions, except along

<sup>&</sup>lt;sup>1</sup> Light fly-screen doors for the summer season.—[Ed.]